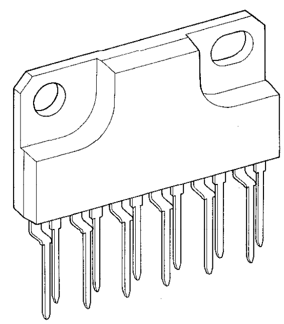
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8208H

5.8W DUAL AUDIO POWER AMPLIFIER

The TA8208H are dual audio power amplifier for consumer applications.
It is designed for high power, low distortion and low noise.
It also contains various kind of protectors.
It is suitable for car-audio power amplifier with high performance.

$P_{OUT} = 5.8W$ (Typ.) / ch
($V_{CC} = 13.2V$, $f = 1kHz$, $THD = 10\%$, $R_L = 4\Omega$)



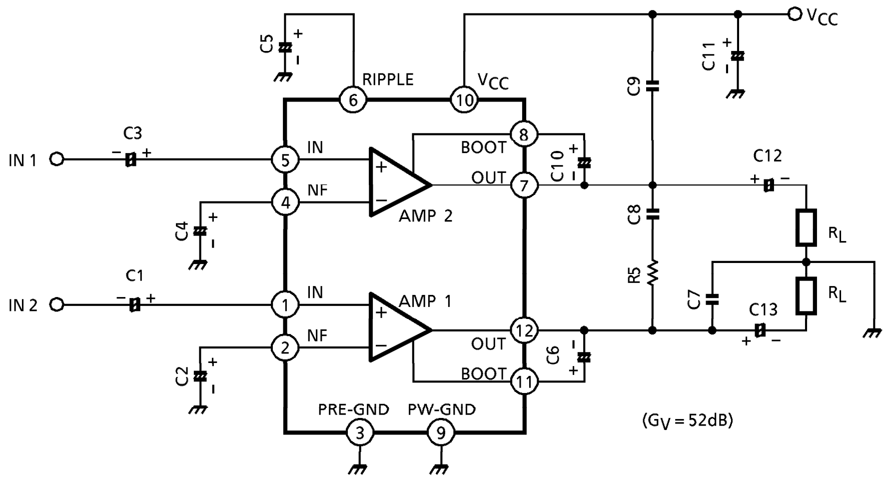
HZIP12-P-1.78B

Weight : 4.04g (Typ.)

FEATURES

- Low Distortion
  : $THD = 0.06\%$ (Typ.)
  ($V_{CC} = 13.2V$, $f = 1kHz$, $P_{OUT} = 1W$, $R_L = 4\Omega$, $G_V = 52dB$)
- Low Noise
  : $V_{NO} = 0.7mV_{rms}$ (Typ.)
  ($V_{CC} = 13.2V$, $R_L = 4\Omega$, $G_V = 52dB$, $R_g = 10k\Omega$, $BW = 20Hz \sim 20kHz$)
- Protector Circuit
  : Thermal Shut Down, Over Voltage Protection.
  Out-V_{CC} short, Out-GND short and Out-Out Short Protection.
- Operating Supply Voltage Range
  : $V_{CC\ (opr.)} = 9 \sim 18V$

BLOCK DIAGRAM



CAUTION AND APPLICATION METHOD

1. VOLTAGE GAIN ADJUSTMENT

The voltage gain G_V is determined by R1, R2 and R_f in Fig.1.

$$G_V = 20\ell og \frac{R_f + R1 + R2}{R_f + R1} \text{ (dB)}$$

In case of $R_f = 0$

The voltage gain is set as follows :

$G_V = 52\text{dB}$ (Typ.)

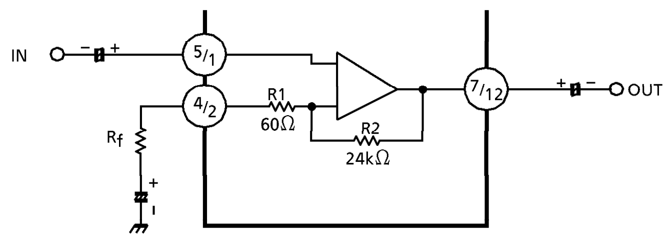


Fig.1

2. MUTING

Audio muting can be accomplished by connecting pin 6 (ripple filter) to GND as shown in Fig.2.
Then, the bias circuits are cut off.
However, caution must be exercised to the following items.

(1) The recovery time from the muting operation is determined by the capacities of the ripple filter capacitor between 6 pin and GND, and of the capacitor for NF.

(2) As this muting system is operated by the short-circuit of ripple filter : C5, the ripple rejection ratio becomes worse in the muting condition.
At mute ON, some pop noises of breaking the bias are produced.

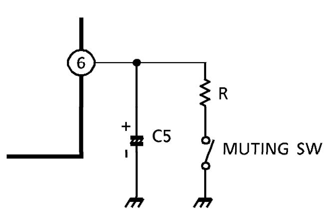


Fig.2

3. MEASURES AGAINST OSCILLATION

C7, C8, C9 : The capacitor of polyester film having small variation of the temperature characteristics is recommended as the capacitor for oscillation prevention.

R5 : Increases the oscillation allowance at output clippling of the low range frequency (100Hz or less).

Since the oscillation allowance varies according of the following items, carry out the temperature test to confirm the oscillation allowance.

(1) Gain to be used (G_V setting)
(2) Capacity of capacitor
(3) Kinds of capacitor
(4) Layout of printed board

It is recommended to use the capacitor having the capacity exceeding the oscillation stopping value.
At using with the voltage gain G_V lowered or with the high range frequency and the oscillation becomes liable to be produced.
Therefore, Application with $G_V = 40dB$ or over is advisable.
Especially for using with the gain lowered in DUAL operation, insert 1000pF between NF (2 pin and 4 pin) and GND.
This capacitor reduces the gain of the high range frequency and is effective for oscillation prevention.

4. OUTPUT WAVEFORM AT POWER SUPPLY ON / OFF (REFERENCE)

Amplifier DC output waveforms in the condition of $V_{CC} = 13.2V$, $R_L = 4\Omega$ at non-signal (input short) are shown in Fig.3.

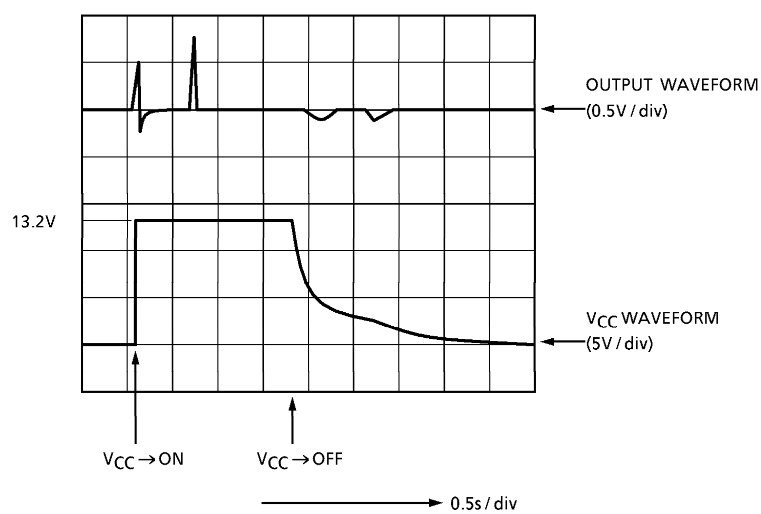


Fig.3

The popping time at power supply ON / OFF varies according to the rise and fall times.
The condition in which the power supply is rapidly and repeatedly made ON / OFF, that is, the condition in which the charge is made on the external capacitor of IC is different from the conditions shown in Fig.3.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Peak Supply Voltage (0.2s)	V_{CC} (surge)	45	V
DC Supply Voltage	$V_{CC\ (DC)}$	25	V
Operating Supply Voltage	$V_{CC\ (opr)}$	18	V
Output Current (peak)	$I_{O\ (PEAK)}$	4.5	A
Power Dissipation	P_D	25	W
Operating Temperature	T_{opr}	−30~85	°C
Storage Temperature	T_{stg}	−55~150	°C

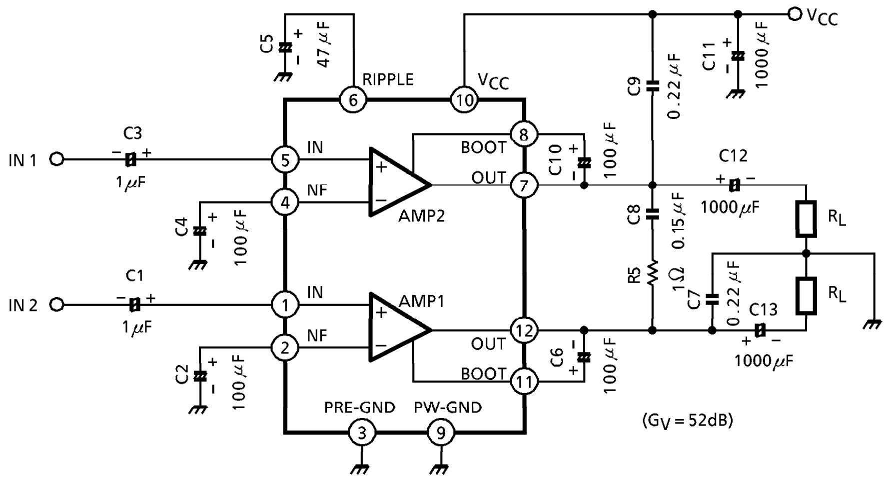
ELECTRICAL CHARACTERISTICS
(Unless otherwise specified, V_{CC} = 13.2V, R_L = 4Ω, R_g = 600Ω, f = 1kHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	—	V_{IN} = 0	—	80	145	mA
Output Power	P_{OUT}	—	THD = 10%	5	5.8	—	W
Total Harmonic Distortion	THD	—	P_{OUT} = 1W	—	0.06	0.30	%
Voltage Gain	G_V	—	V_{OUT} = 0.775V_{rms} (0dBm)	50	52	54	dB
Voltage Gain Ratio	ΔG_V	—	V_{OUT} = 0.775V_{rms} (0dBm)	−1	0	1	dB
Output Noise Voltage	V_{NO}	—	R_g = 10kΩ BW = 20Hz~20kHz	—	0.7	1.5	mV_{rms}
Ripple Rejection Ratio	R.R.	—	f_{ripple} = 100Hz V_{ripple} = 0.775V_{rms} (0dBm)	—	−52	−40	dB
Cross Talk	C.T.	—	V_{OUT} = 0.775V_{rms} (0dBm)	—	−57	—	dB
Input Resistance	R_{IN}	—	f = 1kHz	—	33	—	kΩ

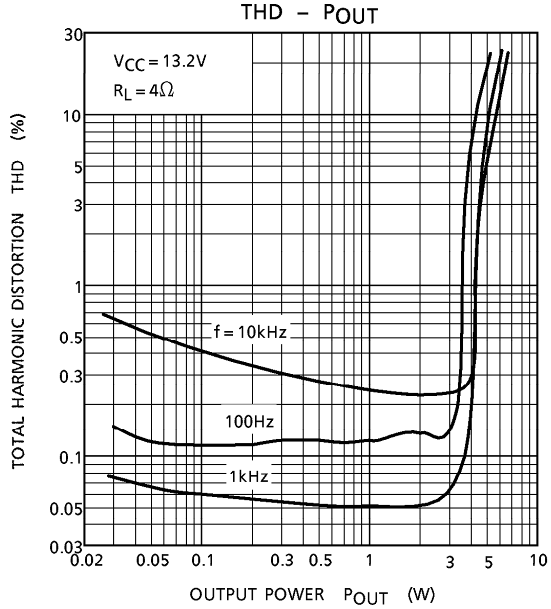
TYPICAL DC VOLTAGE OF EACH TERMINAL
(V_{CC} = 13.2V, V_{IN} = 0V, Ta = 25°C)

TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12
DC Voltage (V)	1.5	1.5	GND	1.5	1.5	6.4	6.4	12.3	GND	V_{CC}	12.3	6.4

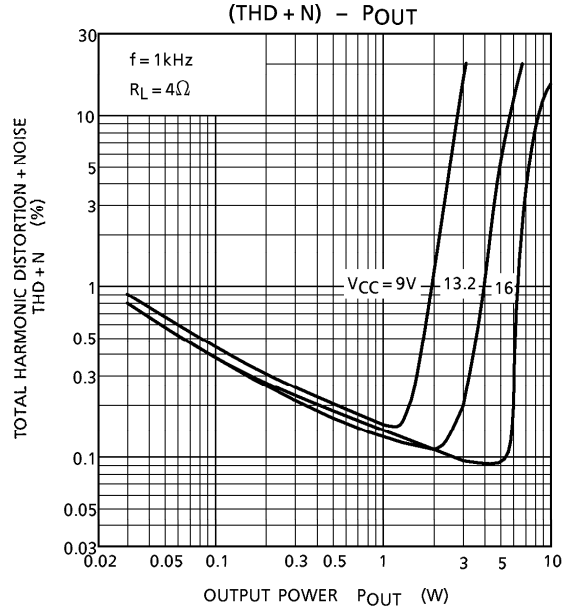
TEST CIRCUIT / APPLICATION CIRCUIT



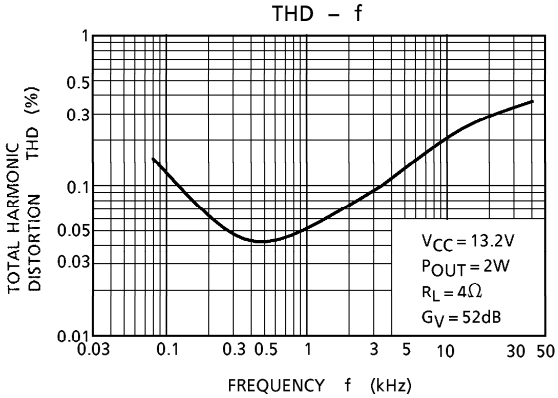
THD – P_{OUT}



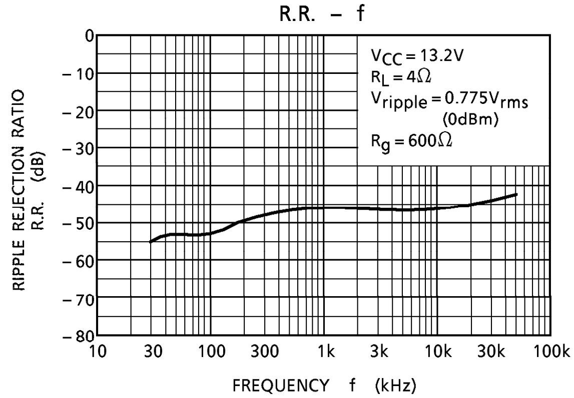
(THD + N) – P_{OUT}



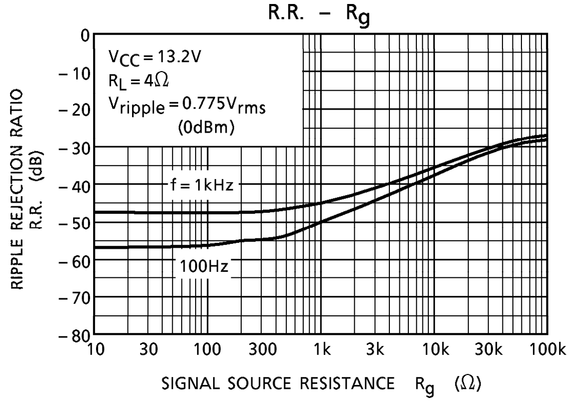
THD – f



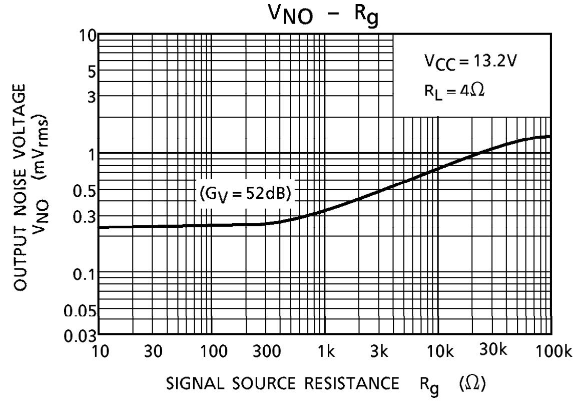
R.R. – f



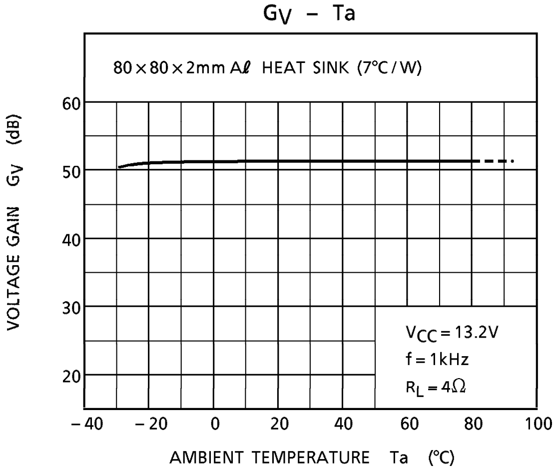
R.R. – R_g



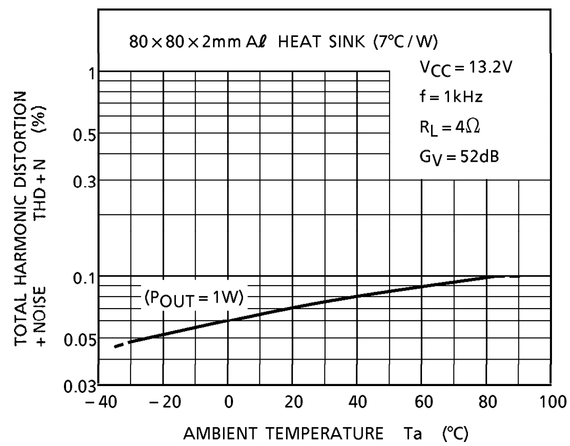
V_{NO} – R_g



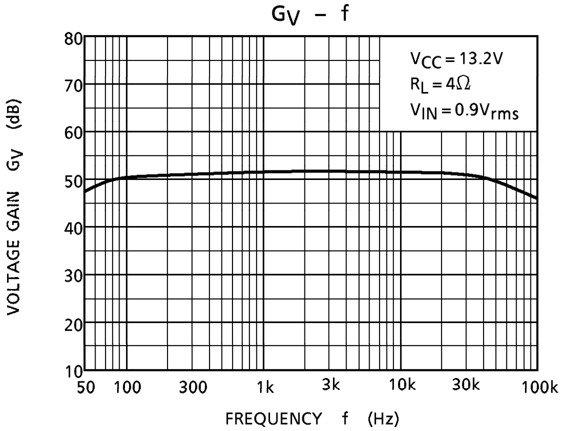
G_V – Ta



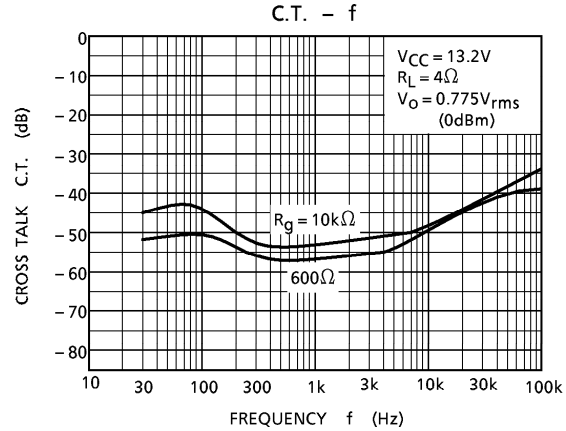
(THD + N) – Ta



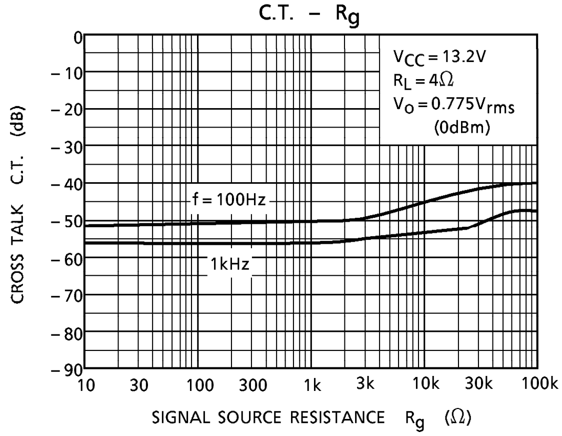
G_V – f



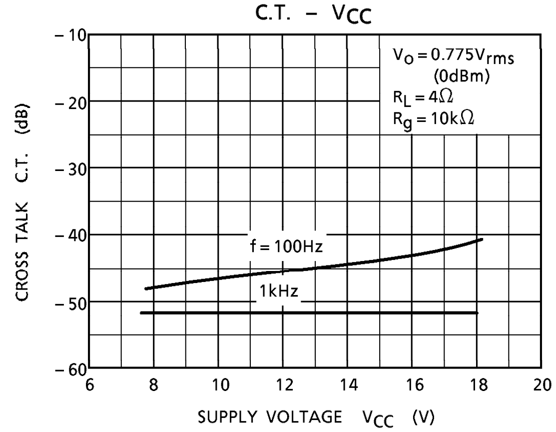
C.T. – f



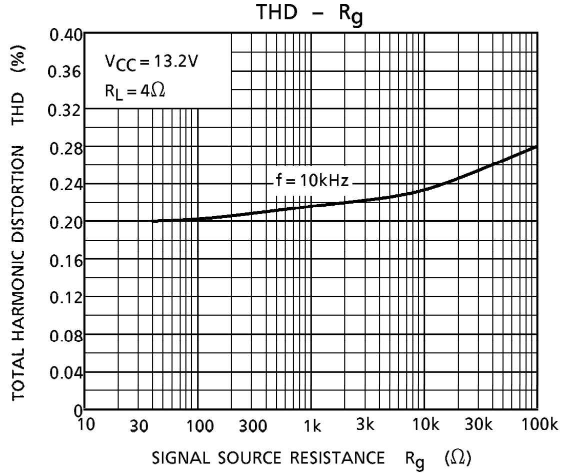
C.T. – R_g



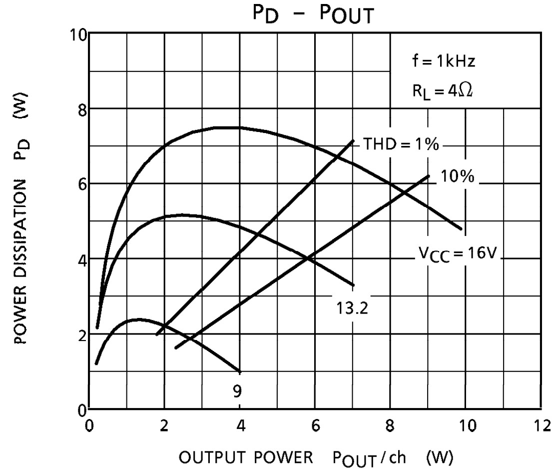
C.T. – V_{CC}



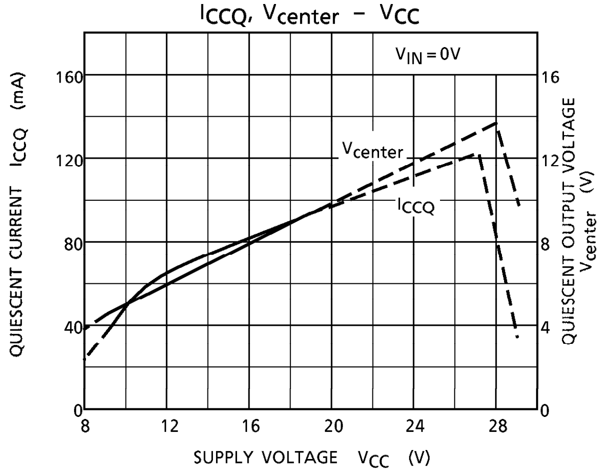
THD – Rg



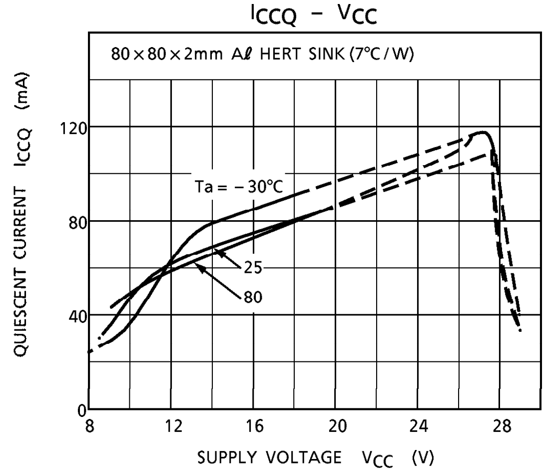
PD – POUT



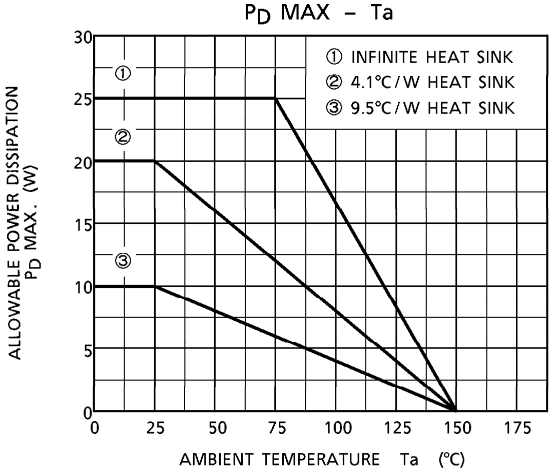
ICCQ, Vcenter – VCC



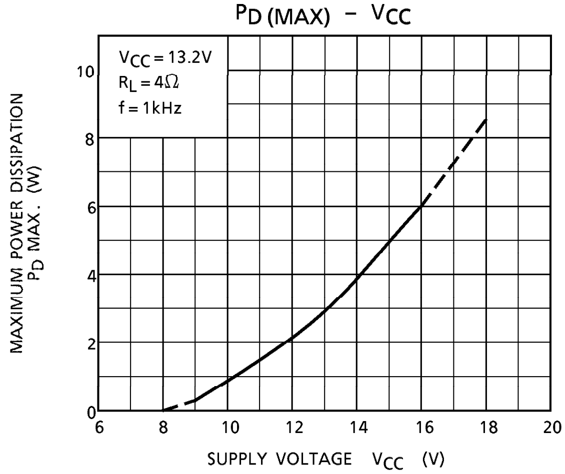
ICCQ – VCC



PD MAX – Ta



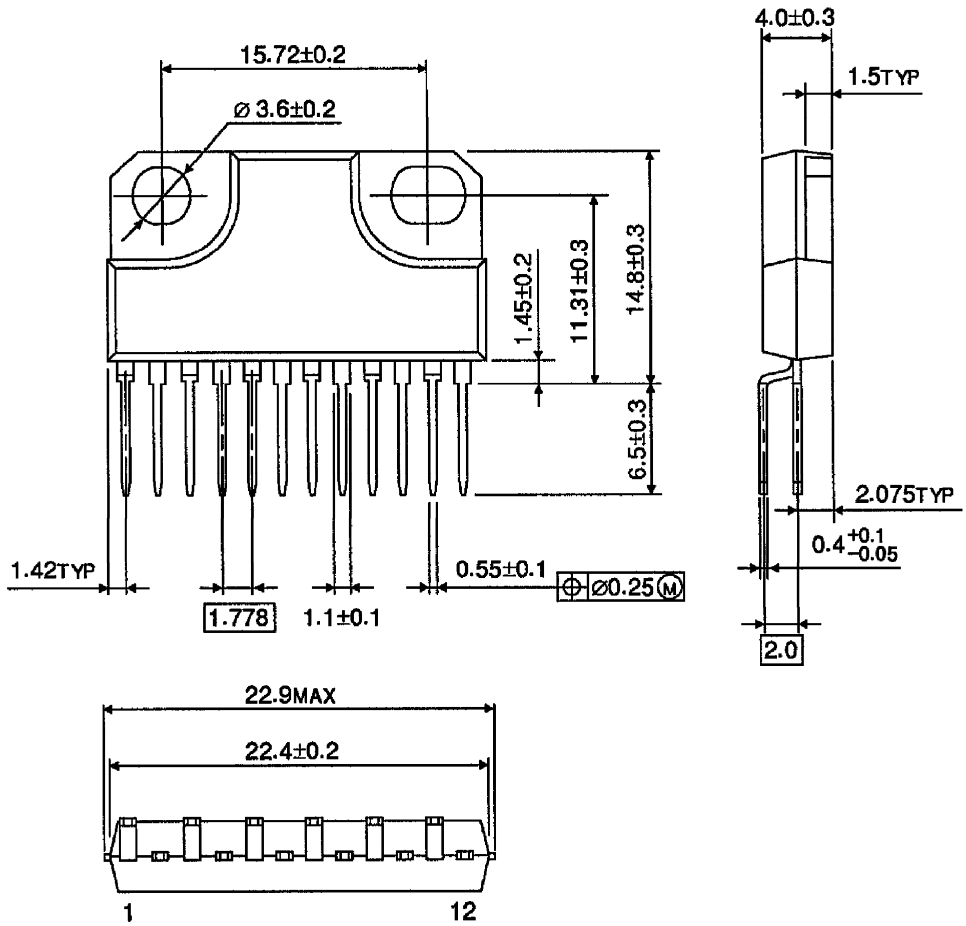
PD (MAX) – VCC



OUTLINE DRAWING

HZIP12-P-1.78B

Unit : mm



Weight : 4.04g (Typ.)